WASH Plus Infrascaping

by

Rudy Dieudonne

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Signature of Author: ____________________________________________

Department of Architecture
January 15, 2014

Certified by: ________________________________________________________

James Wescoat
Aga Khan Professor
Thesis Supervisor

Accepted by: ________________________________________________________

Takehiko Nagakura
Chair of the Department Committee on Graduate Students
Thesis Readers

Reinhard Goethert
Principal Research Associate

J. Phillip Thompson
Associate Professor of Urban Planning
WASH Plus Infrascaping

by

Rudy Dieudonne

SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE ON JANUARY 16, 2014 IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARCHITECTURE

ABSTRACT

For many decades, various non-governmental agencies, and political entities have been working to resolve issues relating to Water, Sanitation and Hygiene within developing countries around the world. One area within the world that has sought to resolve this issue for many years is the country of Haiti. Many NGO’s have sought to resolve issues of WASH within Haiti through the creation and dispersion of latrines and wells. However due to improper maintenance, these interventions soon become inoperable, putting the health of surrounding citizens in far greater risk. My thesis argues that in order for WASH designs to become sustainable, there must be a joint approach between architecture, landscaping and infrastructure, or an approach termed “Infrascaping”.

Through Infrascaping, my thesis proposes to create a community oriented system through landscaping that focuses on collecting water, cleaning it, and then using it to operate the showers, sinks and toilets through a grey water re-use system. With this approach my thesis aims to represent a model for a sustainable WASH design that can be replicated and reconfigured in various locations around the world.

Main Points:
1. Integrating WASH designs into community programs
2. Manipulating the landscape to produce site conditions that support longterm WASH programs
3. Using rainfall as a catalyst for site organization and programmatic distribution

Thesis Supervisor: James Wescoat

Title: Aga Khan Professor
## Contents

- Thesis Proposal  Pg. 7
- Water, Sanitation and Hygiene  Pg. 8
  - Global Approach to WASH  Pg. 8
  - Realms of WASH & Disease Control  Pg. 10
  - Gender Roles of WASH  Pg. 12
  - Solutions for Unsafe Water  Pg. 14
  - Solutions for Hygienic Practices  Pg. 16
- Concept Development  Pg. 20
- Haiti  Pg. 22
  - Population Distribution  Pg. 23
  - Project Development and Investment  Pg. 24
  - Evolution of Water Distribution  Pg. 25
- Mapping Analysis  Pg. 27
  - City Selection  Pg. 27
  - Site Selection  Pg. 32
- WASH + Infrascaping  Pg. 38
  - Phases of Development  Pg. 38
  - Architecture Development  Pg. 40
  - Water System and Movement  Pg. 41
  - Collecting and Purifying Water  Pg. 44
  - Water Purification Process  Pg. 45
  - Volumetrics of Program  Pg. 47
  - Programmatic Diagrams  Pg. 48
  - Architectural Project Plans  Pg. 50
  - Architectural Sections  Pg. 52
  - Exterior and Interior Renders  Pg. 54
- Response  Pg. 58
- Bibliography  Pg. 60
The main focus of this thesis is to create a new design that promotes access to safe water, provides clean environments for communities to live and interact, and encourage proper hygienic practices among residents. All of which are key elements which adequately describe the goals of WASH programs, and also are key issues that many developing countries are struggling to resolve. However the key point is that this thesis proposes to create this design by combining techniques and practices done within the fields of architecture, landscaping, and infrastructural development. Although the techniques and practices used within these fields are often regarded as independent of one another, its through their combination that this thesis aims to prove that a new sustainable model can emerge to address these issues.
Thesis Approach

Infrastructure
Architecture
Landscaping

Infrascaping + WASH

Water
Sanitation
Hygiene

Intervention 2-3 years after completion

Unsafe Latrine
Unsecure Wells
Filthy Canals
In September 2000, a United Nations Millennium Summit was held and over 189 heads of state were present to discuss the tremendous issues that faced developing countries. It was at this summit that 189 state heads agreed to adopt the Millennium Development goals, which were time bound and numerical targets hoped to be address by 2015. These goals addressed poverty, primary education, gender equality, child mortality, maternal health, HIV and Aids, and environmental sustainability. Among these goals was one of particular interest which focused on Water, Sanitation and Hygiene, also known as W.A.S.H.

Water plays a major role in human development, and in many ways it effects all aspects of life. Of all goals approved to be apart of the Millennium Development Program, there are only 2 which has a direct correlation to W.A.S.H related issues, and these are goals 7 and 4. Goal 7: Ensuring Environmental Sustainability, Target 10 states that “by 2015, this program hopes to decrease the proportion of people who live without proper sustainable access to safe drinking water, and adequate hygiene practices. Another Millennium Development Goal which focuses on W.A.S.H. related issues is Goal 4: Reduce child mortality, unsanitized water is the leading cause of child mortality under 5 years of age.

Prior to the initiation of the Millennium Development Goals, there were 2 major organizations that were already heavily involved with projects relating to water, sanitation and hygiene. These 2 organizations were the World Health Organization (WHO) and United Nation's Children's Fund (UNICEF), where both organizations worked with water stressed developing countries around the world. UNICEF focuses primarily with W.A.S.H related issues involving children, where as WHO focus on these same issues involving individuals of all age groups.
Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate.

Reduce by half, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.
Realms of WASH & Disease Control

Water, sanitation and hygiene effects nearly every aspect of human life on earth, and as a result these are major issues which need to be resolved within developing countries. When taking a closer look into these areas separately from one another, it quickly becomes apparent that each area effects separate and similar realms of life. These issues link these areas together and help define them as different social and political realms.

For example, Hygiene deals with a variety of issues such as food cleanliness. In many rural areas around the world, many people do not practice the custom of cleaning food prior to consuming it. As a direct result of this, many people become ill which means the area of hygiene has a direct effect on health as well. Other issues that are effected by the area of Hygiene includes but is not limited to, the environment, and issues of contamination.

Similarly water effects various social and political issues as well. A person’s health is greatly effected by water intake, and a person’s health dictates their abilities to do well in school. So as a result water effects the issue of education. Water also inserts itself within the political realm of gender equality. In many rural areas, females are the gender which is responsible for collecting and distributing water, where as the males are responsible for other aspects of life. As a result of this division in gender roles, women and young ladies spend the majority of their days traveling to collect water. Other areas that are effectsed by water include environmental sustainability, poverty and health.
Sanitation is more complex in that it deals with both the environment and the individual simultaneously. Sanitation does deal with the issues of human waste, produced trash and maintenance. Keeping humans from coming in contact with waste or any contaminated substance is a major component in maintaining a healthy life. However when it is examined closely, human waste is only the result of food and products that are consumed by humans. Products and foods are produced by laborers and the environment, who are both effected and controlled in many ways by the government. The government being the entity that is responsible for creating polices and ordinances that promote healthy ways of living. With this understanding it becomes clear that sanitation merges with water and hygiene on many levels.

Accessing safe water is becoming increasingly important in developing countries around the world, where the governments generally lack the necessary funds to store and distribute water. Safe water is defined as water that is free from harmful substances such as microorganisms. Or Water that has not been in contact with any object or substance that could be contaminated. In most developing countries, unsafe water could be considered grey water, flooding water, water from an unprotected well, and even water in exposed ponds. The purist form of water is water that directly comes from the aquifers below ground. Generally unsafe water infects its host when it is consumed and ingested.

Unsafe Water

Unhygienic Practices

Unsanitary Practices

Unsecured Water

Collected Unsecured water

Consumed Unsecure Water

flies

flies lay contaminates on the food

Consumption of contaminates on the food

Contaminates

Contact with Contaminates

Contact with open sore
Most residents within developing countries develop a set of practices early on in life to help ensure their survival. Generally these practices or behaviors are methods that were passed down to them by the generations that existed prior to their birth. Unlike many developed and progressive countries where both women and men are considered equals within a family structure, within many developing countries there are divisions of status among genders. For example in most developing countries women are still considered the primary care providers and the home makers. Their roles typically consist of taking care of the ill, the elderly, raising the children, maintaining the home, and collecting the water for household and human use. Similarly young women or girls help maintain the home, attend school and collect water as well.

In most developing countries collecting water can prove to be the most challenging of tasks for women, especially in rural areas where water sources are far from their homes. On average a recent report stated that women spend between 12-14 hours a day collecting water, where it includes travel time and the time taken to acquire the water from the source. Often times women and young girls must travel 4-6 times a day to water sources in order to collect water, all in an effort to ensure that their daily tasks are completed. Due to this heavy demand on women’s time and strength, women within developing countries must make sacrifices in order to ensure the survival of their families.

One of the major sacrifices made by women is their education. With so many hours during the day devoted to traveling to water sources, women are forced to neglect their studies and relinquish their hopes of attending a University and becoming more than just a house wife.

The burdens of raising a family is much too large for one woman to manage alone, so due to this the mother usually forces the young
daughter to remain at home and help with the daily chores. Another reason why young women are forced to leave school at an early age is due to the lack of hygienic policies. Many schools in developing countries have no provisions set for separate restrooms for girls and boys. As a result, many parents are uneasy of sending their young girls to school after they have reached the biological point of maturity.

Another sacrifice that women must make to obtain water and maintain a sanitary environment is their health. Traditional women of developing countries have learned to carry water long distances by carrying buckets or containers on their heads, which allows their hands to be available to carry other items. This traditional practice has lead to a series of health problems for women, including headaches and pains in various parts of their body. This practice has even been known to cause miscarriages, as well.

**Physical Effects of WASH On Women**

- Head Pain
- Back Pain
- Knee Pain
- Stomach Pain
- Feet Pain

**Varying Scales of WASH**

- **Hygiene**
  - Person
  - Clean Clothing
  - Bathing
  - Washing Hands

- **Sanitation**
  - Collective
  - Disposing Trash
  - Safe Toilets
  - Areas to Urinate

- **Adequate Water Supply**
  - Whole
  - Access to Clean Water
  - Secure Water Source
  - Operable and Secure Water Way
  - Safe and Clean Water Storage
When focusing on examples which exemplify ways of providing humans with safe water, research shows that historically we have used engineering in the form of dams and canals to provide this service. Both canals and dams operate at the scale of the collective and the whole. There are 3 main types of Dam designs that are currently used today and 6 main types of canals.
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When focusing on architectural examples which exemplify ways of promoting adequate sanitation, research shows that historically we have used toilets and latrines. A toilet or latrine is the main approach humans have taken to separate themselves from their waste. Toilets and latrines operate within the scale of the individual, where there are only three main types of toilets and several types of latrines.
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When focusing on designs which exemplify ways of promoting and ensuring sanitary living environments, research shows that historically we have used waste pails and dumpsters. Both waste pails and dumpsters operate at all three scales of the individual, collective and the whole. There are 3 main types of waste pails that are currently used today and 6 main types of dumpsters.
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For many decades, NGO’s have been struggling to address WASH related issues through the creation and dispersal of latrines and wells. Current NGO practice shows that these structures are placed in areas that are easily accessible by the surrounding community, and are placed within the ground for structural stability. Once the structures have been completed, the task of overseeing the proper maintenance of these structures is done by the residence. However with little knowledge on how to repair these structures, many of these structures are quickly becoming inoperable and hazardous to the surrounding community.

To address this problem of sustainability in WASH designs, this thesis aims to redevelop the organizational relationship among these structures, where all structures are placed within one architecture for easy access and maintenance. Water is collected on the roof and then used to propel a grey water reuse system that unifies all structures.
Using a water pump, water is pumped from the protected retention pond to the top of the building and stored within a tank until it is needed to operate the showers.

The water leaves the tanks and is used to operate the showers which are located on the top floor.

The water collected from the showers is then stored within another tank located below the showers.

The water and waste from the toilets move to the septic tank. The water collected from the sinks is then used for irrigation.
Haiti is one of many countries that are struggling to provide adequate water, sanitized spaces for living, and proper areas that encourage hygienic practices for its residents. Its situation has become even more dire after the 2010 earthquake, which claimed over 1 thousand lives and destroyed major national infrastructures. It was due to this that Haitian waters were contaminated, which brought about the spread of cholera throughout the country. Today, although efforts have been made to clean and contain the spread of this disease, there are still areas of Haiti that have contaminated waters.

It is due to this recent occurrence that this thesis aims to use Haiti as a site for this new model for WASH designs. Due to its geographical location, Haiti receives a large amount of rainfall throughout the year which will benefit rainwater harvesting. This along with a series of other factors including current operable infrastructure makes Haiti an ideal location.
Project Development and Investment

6.2 Million — Effective Hygiene
4.8 Million — Safe Water
2.4 Million — Proper Sanitation

World Vision US, Inc.
American Red Cross
Action Against Hunger
World Concern

8 Projects
3 Projects
2 Projects
1 Projects

76 Projects — 1. Health
43 Projects — 2. Education
25 Projects — 3. Water
22 Projects — 4. Construction
5 Projects — 5. Human Rights
Although Haiti is an ideal location for the development of this thesis proposal, there are many cities and sites across this country that would be ideal for this project. Similarly to current WASH designs, there are various factors that must be considered to ensure that this model is developed in the most effective location.

The criteria I selected to aid in the selection of the most effective city was Production Manufacturing, Road Infrastructure, Canal and River Systems, Landscape, Population, and Flooding Zone. An inability to meet the requirements of any one of these factors could greatly effect the success or cause the possible failure of this project. However it should be noted that there are still many other factors that could be used to help identify an ideal city for project development. These are the minimum that should be considered when choosing a city. Each factor is identified and described here, where each factor is also represented within the generated maps.
This map is presenting the road networks in relation to the population density of urban areas within each department. The ideal site would be one that has a high population as well as being in close proximity to road networks for access.
This map is indicating the areas that have large populations as well as being in close proximity to water networks. The ideal site would be one where the landscape can easily access water in order to run the site operations.

<table>
<thead>
<tr>
<th>City</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gonaives</td>
<td>445,080</td>
</tr>
<tr>
<td>Port-Au-Prince</td>
<td>1,070,397</td>
</tr>
<tr>
<td>Cap-Haitien</td>
<td>627,311</td>
</tr>
<tr>
<td>Jacmel</td>
<td>337,516</td>
</tr>
<tr>
<td>Jeremie</td>
<td>449,585</td>
</tr>
<tr>
<td>Fort Liberte</td>
<td>266,379</td>
</tr>
<tr>
<td>Hinche</td>
<td>565,043</td>
</tr>
<tr>
<td>Miragoane</td>
<td>3,093,698</td>
</tr>
<tr>
<td>Port-de-Paix</td>
<td>300,493</td>
</tr>
<tr>
<td>Mirebalais</td>
<td>773,546</td>
</tr>
<tr>
<td>Les Cayes</td>
<td>565,043</td>
</tr>
<tr>
<td>Jacmel</td>
<td>450,585</td>
</tr>
<tr>
<td>Mirebalais</td>
<td>3,093,698</td>
</tr>
</tbody>
</table>

Legend:
- **Population**: Number of people living in the area.
- **Canal/River System**: Indicates water networks.
- **Road Infrastructure**: Important roads connecting different regions.
- **Land Space**: Suitable land areas for land development.
- **Production/Manufacturing**: Areas suitable for industrial activities.
- **Flooding Zones**: Areas susceptible to flooding.

**National Boundary**: Borders of the country, marking the division between different departments.
This map is indicating the areas that could support this landscape. The areas that have moderate topological shifts and have access to the water networks are the most ideal areas.
This map is indicating the areas that have access to road networks and are located within Flood Zones but are in close proximity to road networks, as well as areas that have the moderate topological shifts.

Hinche
Population: 565,043

Thomassique
Population: 42,557

Mirebalais
Population: 164,910

Les Cayes
Population: 627,311
When considering all of the factors, cities such as Hinche, Thomas-sique and Mirebalais appear to be the ideal cities for the development of this model. Upon further investigation, Mirebalais is the ideal city due to its relatively close proximity to the Artibonite River. The Artibonite river is the largest land water infrastructure that flows through the nation. Water from this river provides water to the entire land through minor streams and ponds.

Mirebalais is a town located within Centre Department of Haiti. Its located approximately 60 km northeast of Port-Au-Prince, and has a population of 9,082. Another factor that makes Mirebalais a great choice for this project, is its location along a hydroelectric power transmission grid. This electrical grid provides power to the entire city throughout the day. Mirebalais is one of the only cities within the nation that has power throughout the entire day.
Site Selection

Similarly to choosing a city, there are certain factors that must be considered when choosing a specific site, such as accessibility, proximity to water, developing population and current infrastructure. However, unlike when choosing a city there are more detailed factors relating to the program of the design that should be considered.

This new model for WASH designs calls for a multipurpose landscape that provides a series of areas for community oriented activities. This new model also calls for a single architecture which houses WASH programs such as restrooms, showers and wells. As a result, the site would need to be located where there is an existing or developing community. This community must value working together for a common goal, as well as being comfortable with sharing supplies and resources. Developing this design in such a community will ensure its success and continual maintenance.
Power Distribution
Population Distribution
Proximity to WASH Programs

[Map showing proximity zones of 250 ft, 500 ft, 750 ft, 1000 ft, 1250 ft, and 1500 ft.]
The site chosen is located on the northwestern portion of the city. It is situated within the center of a growing residential community, on a cleared piece of land. The piece of land itself is 81070 sq feet, with the dimensions of 366.44 ft by 198.50 ft. Just several yards to the left of the site, sits a flood plain which will be an ideal location for storm water drainage, and just 362 feet north of the site is the flowing Artibonite river.

This entire area also has an ideal rain fall condition which can help in rain harvesting and rain water use throughout the year. Research shows that there is an abundance of rain that falls during the months of May-November, followed by a dry period between the months of November-May. Understanding this pattern of rainfall can influence the design of the WASH model, where the site can be used to capture, store and use water for various purposes. As well as harvest rain water for the purpose of recharging the ground aquifers.
Existing Rainfall Conditions

Hot and Dry Climate

Hot and Wet Climate
Phases of Development
(read from the bottom up)

During Phase 1, an NGO reviews the site and begins evaluating its suitability for the development of the project. Once the evaluations are complete, the NGO gathers a group of able bodied community workers who can help begin excavating the site.

During Phase 2, the excavation process is complete. Soil is removed from the ground for the purpose of creating the retention ponds and laying down infrastructural elements, such as pipes and the septic field. The soil removed from the ground is then used to elevate the architecture 4 feet off of the ground.

During Phase 3, the infrastructure is installed within the excavated land. The bounds of the retention ponds are filled, and the necessary infrastructure is installed to insure that water collected on the site can easily move into the retention ponds. Also the initial stages of infrastructure installment is completed in regards to the building.
During Phase 6, the architecture is completed with the addition of the classrooms, the caretaker residence and the cafeteria. With the addition of these programmatic spaces, the landscape is fully operational, and ready for maximum use.

During Phase 5, The first portion of this architecture is completed. This portion of the architecture includes both male and female washrooms. This being the shower and rest room for men and a shower and rest room for women.

During Phase 4, the retention ponds are functioning at full capacity and the pathways are designed and installed on the site. The site uses a ramping system to help residents circulate, as well as help facilitate the draining of on-site rain water.
Architecture Development

The roof is pitched in order to collect water in the central space of the architecture, as well as to provide adequate ventilation within the building. The roof material is corrugated metal.

The roof is structured using timber that is engineered into a simple truss system. The truss system rests gently on the CMU walls, which allow for open interior spaces, unhindered by columns.

The walls are designed to be load bearing CMU walls. Columns are placed within the walls for support, and bands wrap the entire exterior of the building for protection against any seismic activity that may occur.

Land collected from the excavation of the retention ponds is used to build up the foundation of the architecture. The columns are placed on a grid system to provide adequate support to the entire architecture.
Water System and Movement

1. Water collected from the roof system is directed to the central space of the Architecture, where it is collected and stored until it is needed to operate WASH related functions within the building.

2. When the water is needed to perform a function within the building, water moves from its storage area and into the water tank located on the highest level of the building.

3. Using gravity, water moves from the tank and is used to operate the showers within both the men and women WASH areas.

4. Water collected from the showers then move to a 2nd water tank located below the shower levels.

5. When needed, the grey water leaves the 2nd water tank and is used to operate the sinks and the toilets within both the men and women WASH areas.

6. Grey water collected from the sinks, then move to the outdoor retention pond, where it is purified and brought back into the building to restart this grey water recycling process. Black water collected from the toilets moves into an underground septic tank.
Water System and Movement

1. Out door water pump
2. Primary water tank
3. Showers
4. Secondary water tank
5. Rest room
6. Grey Water collected from sinks will be used for irrigation

Balck Water collected will be sent to septic tanks
Site Design

The site for the development of this thesis is located in close proximity to a flood zone. Due to this, the site must be designed to control the amount of water that moves away from the site, and the amount of water that remains on the site. As a result, the landscape is designed to adapt to both the dry and wet seasons of Mirebalais. During the wet season, water collected from the surrounding environment and the site are stored within on-site retention ponds. The retention ponds are engineered to purify all water for the purpose of its reuse within the building.

During the dry season, all of the ponds become dry leaving a thin layer of sand at the bottom. These retention ponds can then be repurposed and reprogrammed. During the dry season, certain ponds can be repurposed to become soccer fields for students, community gathering areas for the surrounding residents, or a community and or school performance space.
Methods for Collecting and Purifying Water

1. Community Garden
2. Student Garden
3. Ramping System
4. Retention Ponds
5. Playing Field
Throughout the landscape, there are varying scales of interventions which are designed to direct water away from the site, as well as direct water to storage areas. One of the major water storage areas are the on-site retention ponds, which also are engineered to purify water. This purification system operates in 5 steps.

During the first step, water enters the first pond from the surrounding site, second the water moves through compacted sand filtration system and enters the second pond. Its from this second pond, that water is accessed for the use within the building. During the fourth step water passes again through a filtration barrier where it is temporarily stored prior to being released into the Airotibonite river.

Along with the retention ponds, there are other interventions made to help drain on-site water. On site gardens were designed with trenches to help alleviate the ac-
cumulation of water near the student educational wing. Within the community garden, a sloped terrain is used to allow for easy movement of water from one plant to the next. Also trenches are located as the very bottom of the slope to capture and direct any excess water accumulated within the garden.

For the purpose of circulation throughout the site, a ramping system is engineered to allow for easy collection of water through drains that are located at low points. All small water collection systems deliver water to the retention ponds where it undergoes cleaning and reuse.

All of these individual systems are linked together within underground infrastructure to create a unified drainage and water collection system for the site.
Volumetrics of Program

The architecture of this proposal revolves around water collection and its movement throughout the building. Water is collected, through roof structure, where it is stored underground and then pumped back to the top of building when it is needed. Using gravity as a propeller, water moves from the tank to operate the showers. Then it continues to move in a downward movement to operate the sinks and toilets. As a result of this organization, the architecture is designed, where the showers are on the entire second level of the main building, leaving the first level of the main building for the sinks and toilets.

The first level also includes the cafeteria, the main office, the caretaker’s residence and the educational wing. The first level also consist of the student and community garden, as well as the student playground.
Programmatic Relationship

Design Factors
- Operating During Evening
- Operating During Morning/Afternoon
- Operating 24 hrs per day
- Security Needed
- Sound Sensitive Programs
- Sound Intensive Programs
- Close Proximity Needed
- High Maintenance

- Kitchen
- Shower
- Restroom
- Class Room
- Class Room
- Play Ground
- Retention Pond
- Garden
- Child Care
- Community
- Children
Existing Site Organization

Method

Proposed Site Organization

Method

Infra-scaped relationship between Architecture and landscape

Site / Architecture Circulation

Site Drainage

- Architecture
- Open Space
- Retention Ponds
- Programmatic Landscape
- Architecture
- Community
- Students
- Off-site Water
- Black Water
- Septic Field
- Off-site Water
Second Floor Plan

Key:
A. Men's Shower Area
B. Women's Shower Area
C. Drying Area
D. Grooming Area
E. Locker Room
Section: 1”=16’
Section: 1”=16’
Interior Men’s Restroom View
Water Purification Process
On December 19th 2013 I presented WASH + Infrascaping thesis to a group of reviewers. Once the presentation had concluded, they provided feedback on the overall concept and development of the project. In this section I would like to respond to the comments made by the reviewers, and offer insight into the steps I would have taken to develop this project further.

**Critics:** How was the proposed design influenced by the original thesis proposal?

**Response:** The overall proposal was to create a new model to address WASH issues, by combining design techniques practiced in architecture, landscaping and infrastructure development. The proposed design is a multipurpose landscape that collects water throughout the site, as well as provides spaces for community oriented activities. This design is essentially a structural landscape that has a series of retention ponds and various small scaled systems that collect, store and clean water. These landscaped systems are influenced by the main architectural building which is situated within the middle of the site. This structure houses all of the programatic spaces which address a majority of the issues relating to WASH. These programatic spaces that address WASH issues are shower areas, restrooms, and water collection areas. The purified water brought in from the retention pond is used to operate the showers, sinks and toilets using a grey water reuse system. Also this main architecture is designed to collect rainwater through its roof structure, where the water collected is used to operate the WASH spaces as well. The surrounding spaces of the architecture is then used for community oriented activities, such as a kitchen and garden. The positioning of these exterior programs are directly related and influenced by specific landscape systems. A design such as this creates an overall system that shows a clear yet complex relationship between the landscape, infrastructure and architecture, which is precisely what the objective of this thesis proposed.

**Critics:** What concepts help direct the design of the overall site?

**Response:** The concept which aided in the creation of the overall site came from Haitian culture. “Lakou” is a Haitian term which refers to interstitial space that exists between two adjacent structures. Generally this space is large enough for groups of people to gather and converse, such as a back yard or lawn area. Understanding that this thesis design must be accepted by the community in order to succeed and become sustainable, I designed the overall landscape as a series of Lakous. I design the architecture to have undefined boundaries, which allowed for a strong relationship between the exterior and interior spaces. There are moments within the design, where the architecture shifts and extends into the landscape to create instances of contained spaces. These spaces are the “Lakou” spaces, and these spaces are programmed to relate to the landscape systems that are adjacent to it, as well as the interior spaces of the architecture which is adjacent to it.

**Critics:** Why is the scale of this design so large, when WASH issues have generally been resolved using small structures such as latrines and wells?
Response: The design that this thesis proposed should be looked at as a model in which its size can be increased or decreased depending on the context in which it is developed. This design should be used as a tool for learning how WASH programs can be combined and organized to create a unified and sustainable systematic design.

It is true that in the past, NGO’s have resolved this issue by creating small latrines and wells, but they also have failed to remain operable after 2-3 years due to this approach. This is the reason why the proposal was made to combine these individual systems into one unified system within one architecture. However to create this proposal, the design called for a large scale development, one that could provide adequate space for access by the community and proper maintenance throughout the years. The extra programmatic spaces such as the educational areas, community garden and kitchen were included due to Haitian’s strong belief in working together and sharing resources. Programmatic spaces such as this only increased the community investment of the project. Yet if this project had been placed in another location, such as somewhere in Africa, this thesis would probably have not included these extra programs. The context played a major role in directing the development of this WASH model.

Critics: There are many instances where there are seamless connections between exterior and interior spaces, was the climate of the area considered?

Response: During the development of this thesis, climate always played a major role in overall design. Generally the temperature throughout HAITI is moderately warm due to its subtropical climate. As a result there are very few instances where temperatures drop below 50 degrees Fahrenheit. All exterior and interior programs were placed in locations where it could receive the necessary amount of light for its intended purpose. The open character of the architecture was used because the architecture was designed to be a large unconditioned space that did not depend on electricity for cooling and ventilation. Due to Mirebalais’s often unreliable energy source, the architecture was designed to use natural ventilation as a system for moving air into and out of the building.

Further Development:
Based on the recommendations and suggestions made by my reviewers, to develop this proposal further I would slightly adjust the architecture to better correspond with the design concept. Currently the architecture sits with what appears to be defined edges creating a defined sq-fottage. To develop this concept of the “Lakou” I would remove the main lobby to create a main open area within the proposed architecture. A main open area which clearly connects to the surrounding exterior spaces. This would result in the thesis design to appear as a series of structures which situates itself within a structured landscape, as opposed to one building. This approach would still echo my original proposal, because all WASH issues would still be combined within one structure, and this adjustment would lead to more open and accessible site.


